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ANALYSIS OF FACTORS AFFECTING SMALLHOLDER FARMERS COOPERATIVE CHANNEL CHOICE IN VEGETABLE MARKETING

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ABSTRACT

Vegetables are perishable commodities and need to be marketed as and when they are harvested. Smallholder farmers can better position themselves through cooperative marketing. The main focus of the paper was to identify the socio-demographic and market attributes determining the cooperative marketing among smallholder farmers. The factors which are favorable for the cooperative marketing are identified in this paper. The findings of the econometric analysis reveal the main factors significantly influencing the cooperative market participation are extension activities, the number of quality checks to the produce, the area under vegetables, drip irrigation, vehicle ownership and the proximity. The study has suggested that cooperatives should prioritize those factors that have greater impact on their success

KEYWORDS: Cooperative Marketing, Logistic Regression & Smallholder Farmers

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INTRODUCTION

Small holder farmers are those farmers who have the landholding of less than 2 ha of land (Birthal, Joshi, Roy, & Thorat, 2013; GOI, 2005). Small holder farmers are more predominant and the prospect of the Indian agriculture, its sustainable growth and self-sufficiency depend on the performance of these small holders. Farming is the main occupation in rural areas and acts as the main form of employment and income generation for rural people. Markets are important particularly for smallholder farmers because their market participation and its economic outcome are pre-linked to the allocation of scarce resources, good and services. Market participation is important to derive benefits (Dorward, Poole, Morrison, Kydd, & Urey, 2003) such as income. Vegetable marketing is complex in nature due to their perishable nature. They have to be marketed as and when they are harvested as most of them lack cold storage facility. Further, these vegetables are characterized as bulky with seasonal production (Gandhi & Namboodiri, 2004). The area under fruits and vegetables has been increased to 5.5 percent in 2001-03 from 2.9 percent in 1980-82 correspondingly the share of output increased to 26.5 percent from 20.2 percent (Birthal et al., 2013). Nationally about 15.3 percent of the farm households are growing vegetables; among them, 16 percent are small farmers (area less than 2 ha) contributing 61 percent of the aggregate vegetable production (Birthal et al., 2013; GOI, 1999).

Small holder farmers face difficulties in accessing markets as a result markets fail from performing their duty (Jari & Fraser, 2009). General belief is that agriculture cooperatives have great potential in agriculture and rural development (Azadi, Hosseininia, Zarafshani, Heydari, & Witlox, 2011; Dejene & Regasa, 2015). Cooperative marketing was identified as the marketing channel which eliminates the market intermediaries and maximizes benefits for both producer and consumer.

In developing countries the empirical investigation done on the factors influencing market participation is minimal (Ouma, Jagwe, Obare, & Abele, 2010). Thus, with the above-described constraints and features of smallholder farmers the study considers the factors influencing the choice of cooperatives to sell their produce. The remaining part of the paper starts with the data collection and description of the econometric model. Finally, results are presented with the concluding remarks.

METHODOLOGY

The research was carried in the three districts namely Kolar, Chikkaballapur, Bangalore rural district of Karnataka, India. The research area had different marketing channels for the farmers to market their produce. The study employed both descriptive and econometric analysis to investigate the factors influencing the choice of marketing channel.

Data Collection

The focus was mainly on the smallholder vegetable growing farmers. The data was collected randomly from 100 vegetable farmers by researcher via semi-structured interview by means of face to face interview in regional language. It was made clear for the respondents at the beginning of the interview that data was collected only for the research purpose. The Survey provided the information about the farmer's choice of marketing channels, household characteristics, market attributes.

Empirical Model

Factors' influencing the choice of market channel is analyzed using logit model. In this model smallholder, farmers' cooperative market participation is the dependent variable with a binary choice as either participating or non-participating to market vegetables. The logistic regression model (Jari & Fraser, 2009) depicting the farmers' cooperative market choice is:

$$Logit\ P(i) = ln\left(\frac{P_{(y=1)}}{1 - P_{(y=1)}}\right) = \beta_0 + \sum_{i=1}^{n} \beta_i x_i \quad (1)$$

Here P is the probability that y=1 and farmer is participating in cooperative and $(1 - P_i)$ represents non-participating in cooperative, i.e. the model was used to assess the odds of co-operative participation vs non-participation. Here, x_i are the set of explanatory variables and consists of both continuous and dichotomous variables during analysis. β_i gives vector of estimated coefficient. Further, $\left(\frac{P_{(y=1)}}{1-P_{(y=1)}}\right)$ is an odds ratio (Gujarati, 2009) taking antilog of $\left(ln\frac{P_{(y=1)}}{1-P_{(y=1)}}\right)$ i.e. $e^{\beta_0+\Sigma_{i=1}^{n}\beta_i x_i}$ gives the better interpretation of the coefficients.

RESULTS

Descriptive Statistics and the Variable Definitions

It is evident from the past studies that the choice of marketing channel depends on socio-economic characteristics of the farm households and market attributes which include the above-listed variables. Variable definition and the descriptive statistics of the variables used in the model are reported in Table 1. Cooperative *(Cooperative)* marketing choice of the farmer is the dependent variable and takes the dummy variable value 1 for the person who is selling in cooperative and zero otherwise. Others are independent variables and listed in Table 1.

Table 1: Description of the Dependent and Independent Variables Used in the Model

Variables	Description	Mean	SD
Cooperative	1 if Selling in co-operative	0.46	0.50
Age2	Age (Years)	39.51	9.76
Education	1 if the producer is illiterate		
	2 if the producer has done primary education	0.14	0.35
	3 if the producer has high school	0.29	0.46
	4 if the producer has the pre-university education	0.10	0.30
	5 if the producer has attained university degree	0.19	0.39
HHsize	Total number of household family members	5.77	2.83
Extn	Number of extension activities involved	2.14	2.98
members_high_edu	Number of family members with university education	0.71	0.86
VegArea	Area under vegetables (ha)	0.79	2.00
Drip_irrigat~n	1 if it is drip irrigation	0.74	0.44
Subsidiary	1 if involved in dairy	0.73	0.44
NrQualCheck	Number of quality checks done	3.05	1.30
OwnTrans	1 if owns own transport	0.86	0.35
NearD	Distance to nearest market (Km)	9.44	7.62

One of the important independent variable depicting the characteristics of the farmer is age and it is used as a proxy for the experience. The mean age of the sample farmers was 39.5 years. This shows that the head of the household in most of the households who is involved in the farming activity is middle aged. Further, the square of the age is taken for the analysis. It is assumed that as the age increases the experience of the farmer increases exponentially. Thus it is hypothesized that age will influence the choice of marketing. Another farmer characteristic education *(Edu)* is an indicator of marketing practices (Xaba & Masuku, 2012) influencing the choice of marketing as it ensures the information flow. The descriptive statistics shows that most of the farmers involved in farming in the sample survey have completed the high school education while the number of farmers who have completed the university education is less. Similarly, a number of extension activities involved by the farm *(Extn)* reflect the farmer's involvement to get the information on production and marketing strategies. The survey shows the mean number of extension activity in the past five years is only 2. It is hypothesized that the university education to any of the farmer family members *(members_high_edu)* involves information flow hence influence the choice of marketing. Table 1 shows that the mean is 0.71, which means, many of the farming households lack university educated person. Farm Size proxy for wealth, has structured important in the literature of the marketing choice decisions (Kalinda, Filson, & Shute, 2000; Neven, Odera, Reardon, & Wang, 2009; Shilpi & Umali-Deininger, 2008). Table 1 shows that on an average the farmer was having 0.79 ha of vegetable farm size *(VegArea)*. Drip irrigation *(Drip_irrigat~n)* reflects the technological acceptance and there are about 74 percent of the farmers with drip irrigation. It is hypothesized that the technological acceptance in the production activities will also influence the acceptance of high-value marketing channels. The farmer who is involved in dairy activity takes the dummy variable value 1. The farmers in the region were selling their produce through dairy cooperatives, hence hypothesized to have a positive effect on the cooperative marketing of vegetables. In the sample about 74 percent of the farmers were involved in dairy farming along with vegetable farming. Technical activities in the farm are inferred from the number of quality checks (*NrQualCheck)* done before selling the produce. The descriptive analysis shows that on an average the

farmers were doing 3 quality checks before selling the produce. Quality adoption is labor intensive technique. The household family size *(HHsize)* economically implies cheap labor, thus influencing the bargaining position for the quality produce (Wollni & Zeller, 2007). When the production is less, it is assumed that the farmers use the own transport *(OwnTrans)* for transportation of the produce. Further, distance *(NearD)* will influence the choice of marketing channel. On an average, the farmers were situated within the 9.44 km from the nearest market.

Econometric Results

The empirical results obtained from the logistic regression are summarized in Table 2. The likelihood ratio statistic was significant at 1 percent level of probability indicating the overall significance of the explanatory variables in explaining the choice of cooperative marketing channel. The results show that 6 parameters are significant at 10 percent critical level. The estimated coefficients and their positive/negative sign indicate how much more/less likely that the farmer with that specific attribute chooses the cooperative marketing. The results show that the number of extensions activities attended by the farmer significantly influences the farmers choice of cooperative marketing channel. The positive coefficient indicates that probability of a farmer selling in cooperative increases with an extension activity attended. The variable area under vegetables is found to be significant. The negative coefficient indicates that per unit increase in the area under vegetables the probability of a farmer selling in cooperative decreases, contrarily as the area increases the farmers look for the other marketing channels to sell their produce. This also means that cooperative is the main marketing channel for those smallholder farmers with the lesser area thus accomplishing the goal of cooperative in helping the resource poor farmers. Drip irrigation has got positive significant coefficient. The farmers who are having drip irrigation are more likely to participate in cooperative marketing. This can be interpreted as the farmers who were involved in drip irrigation are those persons who have adopted the advancement in the technology and also imply that acceptance of high-value marketing channel i.e. cooperative.

Table 2: Parameter Estimated for Market Choice Determinants

Cooperative	Coefficient	Std. Error	P>|z|
Age2	0.00	0.000	0.383
Edu			
2	0.69	1.213	0.569
3	-0.07	0.883	0.936
4	1.58	1.802	0.379
5	1.08	1.083	0.319
HHSize	0.20	0.141	0.157
Extn	0.37	0.183	0.043*
members_high_edu	0.41	0.430	0.342
VegArea	-1.73	0.588	0.003**
1.Drip_irrigat~n	2.08	0.841	0.013*
1.Subsidiary	1.44	0.916	0.115
NrQualCheck	1.10	0.332	0.001**
1.OwnTrans	2.05	1.189	0.085*
NearD	-0.20	0.061	0.001**
_cons	-6.74	2.132	0.002**
**, * Significant at 10% and 5% level respectively Prob > chi2 = 0.000			

A number of quality checks are important in determining the cooperative choice. The significant positive coefficient for a total number of quality checks indicates that for every unit increase in the quality check the probability

that a farmer sell in cooperative also increases. Quality checks have a positive influence on the farmers to sell in cooperatives. This may be due to the fact that to sell in the cooperative the grading procedure is important and the farmer has to do more number of quality checks before selling in cooperative. The presence of own transport influence the choice of marketing channel as this avoids the hiring costs to transport the produce. Statistically significant, positive vehicle ownership coefficient indicates that farmers have the own transport to transport the produce are more likely to participate in cooperative marketing. This may be due to the fact as most of the cooperatives are situated within the reach of the farmers they use their own transport to bring the produce. Proximity is yet another important variable influencing the choice of marketing channel. The distance for the nearest marketing channel is statistically significant in predicting the choice of cooperative marketing channels. The negative coefficient indicates that The distance has a negative impact on the likelihood of selling in cooperative. The longer distance to producer organizations drives smallholder farmers to other forms of marketing. The variables age education and dairy farming have no statistically significant effect on cooperative marketing channel choice

CONCLUSIONS

Smallholder farmers depend largely on agriculture for their livelihoods. The choice of marketing channel to sell their produce will have the impact on income. Cooperatives are those marketing channels which are formed to enable the smallholder farmer's inclusiveness to markets. In this context, the article has analyzed sociodemographic characteristics and market attributes influencing the choice of cooperative channel to market their produce. The econometric findings show that that variables extension activities drip irrigation total number of quality checks done before selling the produce and the vehicle ownership is positively significant in determining the cooperative choice. Whereas area under vegetables and distance have the negative impact. This shows the main barrier for the cooperative choice is distance. Reducing the distance and setting up of the cooperatives within the reach of the farm field will have a positive effect on the farmers to sell in cooperatives. Although producer organization sends the vehicles to the farm field vehicle ownership to transport the produce is found to be an important variable. Thus the cooperatives have to bridge the gap so that the farmers who do not own the transport can also have better access to cooperative marketing. Policies can be aimed at farmers adoption drip irrigation which indirectly also encourages the cooperative marketing. Also, there is need of extension activities and awareness for the farmers to attend the same. The post-harvest quality management suggests that cooperatives encourage grading of produce, which may also mean farmers are reaping the benefits of grading through sorting and grading activities. The recommendations thus center on enabling smallholder farmers to participate in cooperatives to capture more value through quality improvement.

REFERENCES

1. *Azadi, H., Hosseininia, G., Zarafshani, K., Heydari, A., & Witlox, F. (2011). Factors influencing the success of animal husbandry cooperatives: A case study in Southwest Iran. Journal of Agriculture and Rural Development in the Tropics and Subtropics (JARTS), 111(2), 89-99.*
2. *Birthal, P. S., Joshi, P. K., Roy, D., & Thorat, A. (2013). Diversification in Indian Agriculture toward High-Value Crops: The Role of Small Farmers. Canadian Journal of Agricultural Economics/Revue canadienne d'agroeconomie, 61(1), 61-91. doi:10.1111/j.1744-7976.2012.01258.x*
3. *Dejene, E., & Regasa, D. G. (2015). Factors Affecting Success of Agricultural Marketing Cooperatives. International Journal of Cooperative Studies, 4(1), 9-17.*

4. *Dorward, A., Poole, N., Morrison, J., Kydd, J., & Urey, I. (2003). Markets, institutions and technology: missing links in livelihoods analysis. Development Policy Review, 21(3), 319-332.*
5. *Gandhi, V. P., & Namboodiri, N. (2004). Marketing of fruits and vegetables in India: A study covering the Ahmedabad, Chennai and Kolkata markets.*
6. *GOI. (1999). Cultivation practices in India. National Sample Survey Organization, Central Statistical Organization, Ministry of Statistics and Program Implementation. Retrieved from New Delhi:*
7. *GOI. (2005). Access to modern technology for farming. National Sample Survey Organization, Central Statistical Organization, Ministry of Statistics and Program Implementation. Retrieved from New Delhi:*
8. *Gujarati, D. N. (2009). Basic econometrics: Tata McGraw-Hill Education.*
9. *Jari, B., & Fraser, G. (2009). An analysis of institutional and technical factors influencing agricultural marketing amongst smallholder farmers in the Kat River Valley, Eastern Cape Province, South Africa. African Journal of Agricultural Research, 4(11), 1129-1137.*
10. *Kalinda, T., Filson, G., & Shute, J. (2000). Resources, household decision making and organisation of labour in food production among small-scale farmers in southern Zambia. Development Southern Africa, 17(2), 165-174.*
11. *Neven, D., Odera, M. M., Reardon, T., & Wang, H. (2009). Kenyan supermarkets, emerging middle-class horticultural farmers, and employment impacts on the rural poor. World Development, 37(11), 1802-1811.*
12. *Ouma, E., Jagwe, J., Obare, G. A., & Abele, S. (2010). Determinants of smallholder farmers' participation in banana markets in Central Africa: the role of transaction costs. Agricultural Economics, 41(2), 111-122. doi:10.1111/j.1574-0862.2009.00429.x*
13. *Shilpi, F., & Umali-Deininger, D. (2008). Market facilities and agricultural marketing: evidence from Tamil Nadu, India. Agricultural Economics, 39(3), 281-294. doi:10.1111/j.1574-0862.2008.00333.x*
14. *Wollni, M., & Zeller, M. (2007). Do farmers benefit from participating in specialty markets and cooperatives? The case of coffee marketing in Costa Rica1. Agricultural Economics, 37(2-3), 243-248.*
15. *Xaba, B. G., & Masuku, M. B. (2012). Factors affecting the choice of marketing channel by vegetable farmers in Swaziland. Sustainable Agriculture Research, 2(1), 112.*